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Marketing Hawaii's Agricultural Products

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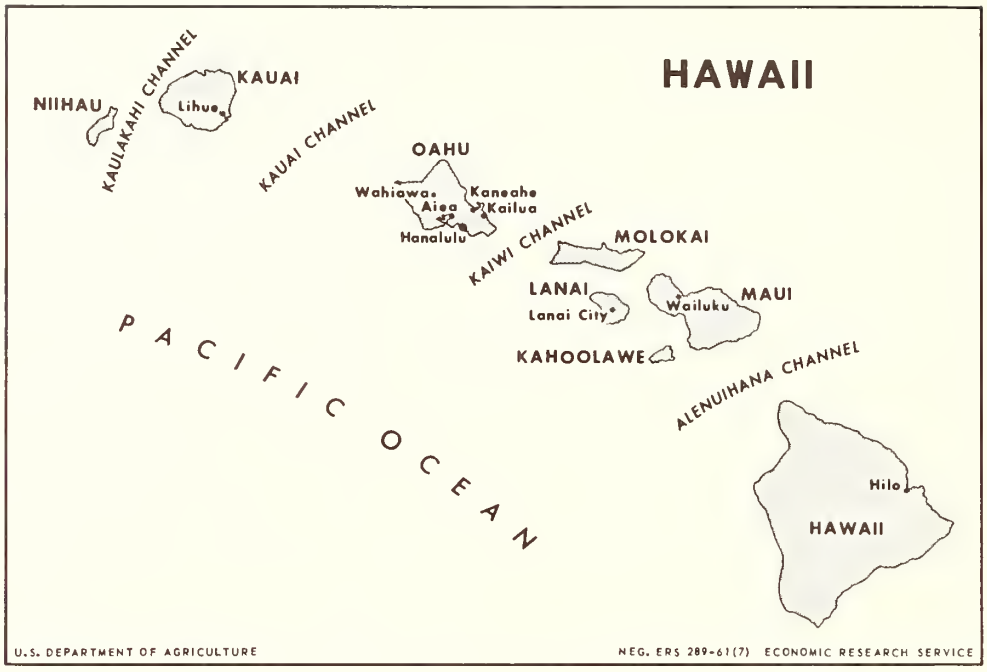

UNITED STATES DEPARTMENT OF AGRICULTURE
1862 1962
Growth Through Agricultural Progress

MARKETING HAWAII'S AGRICULTURAL PRODUCTS 1/

The large producers of sugar and pineapple, Hawaii's principal agricultural products, process and distribute their own crops and those of smaller producers. Competition encountered by both products has been increasing and is expected to become stronger. Producers are meeting competition by promotion and product improvement.

Hawaii imports many farm products. Most of these could be produced in Hawaii, but it is more advantageous to specialize in products in which the State has a comparative advantage. Production of poultry and eggs has expanded rapidly in recent years, and price premiums local products receive over imported products have declined. Further reductions are expected if local producers supply a larger share of the market. Producers have maintained the premium for locally produced pork by supplying a decreasing proportion of the growing market. Production of livestock and livestock products is limited by shortage of feed concentrates.

Farmers on islands other than Oahu have hesitated to increase production for the Honolulu market because of the lack of fast, economical transportation among the islands. The State government and private interests are trying to improve transportation.

Since World War II supermarkets have replaced many smaller retail food stores. As a result of an increase in direct buying by retailers from producers, several wholesale firms have discontinued business. Direct buying is expected to increase, causing big changes in marketing institutions and practices.

Growth in population will swell the market for food products. Hawaiian farmers may also supply a larger part of the food bought for the Armed Forces stationed in the State. Aggressive marketing may develop more extensive export markets for coffee, some subtropical fruits, macadamia nuts, and other specialty products.

The Physical and Economic Setting

The 50th State is separated from the mainland United States by over 2,000 miles of the Pacific Ocean. It is even farther removed from the important population and trading centers of Asia and Oceania.

Hawaii is made up of a chain of seven principal islands extending over 390 miles and separated one from another by channels that vary from 8 miles to 72 miles in width. (See map on cover.) The total land area of these major islands

1/ Prepared by C. W. Peters, Agricultural Economist and Head, Department of Agricultural Economics, Hawaii Agricultural Experiment Station, and Professor of Agriculture, College of Tropical Agriculture, University of Hawaii.

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is approximately 6,400 square miles with individual islands varying from 4,030 square miles for the island of Hawaii to 72 square miles for Niihau. Of this land area it is estimated that about 1,400,000 acres are currently devoted to agriculture, but only 315,000 acres are used for cultivated crops. The bulk of the cultivated lands are located on slopes leading upward from the sea and in saddle areas between mountains. The State has only one short river, although numerous small streams flow intermittently depending upon rainfall.

Climatically, Hawaii is subtropical and has a continuous summer temperature. Temperature ranges at the lower elevations are narrow, and the location of the Islands also tends to maintain a relatively constant day-night relationship throughout the year. Rainfall varies greatly depending in large part upon elevation and exposure to trade winds. Thus, the windward portions and the higher sections, except those over 5,000 feet, are generally moist. The land resources are primarily volcanic in origin and much of the area is mountainous and rough. When managed properly the cultivated lands of the Islands have proved to be very productive. A wide variety of crops, other than most deciduous tree fruits and small grains, is produced commercially, and livestock is an important source of agricultural income.

According to the 1960 Census, the population of Hawaii was 632,772. Density of population varies from island to island, but 80 percent of the total was listed for Oahu, the island where Honolulu is located. This extreme concentration of population on Oahu where the density is almost 850 per square mile has a marked effect on the marketing of locally produced commodities that are consumed in the Islands.

The geographic position of the 50th State has a marked influence on its economic characteristics. As an outpost of the United States and a crossroads of transportation routes in the Pacific, the Islands have developed into an important operational center for military, airline, and shipping services. Hawaii has long been noted as a tourist attraction and this activity has been assuming increasing importance as a source of income during recent years.

Sugar and pineapple are the foundation of the agricultural sector of the State's economy. These crops are particularly well adapted to the subtropical conditions that prevail in the Islands.

The marketing of both imported 2/ and locally produced farm commodities is influenced by the basic structure of the Island economy. As an indication of the nature of Hawaii's economic base, it is of interest that the following totals accounted for the bulk of the business activity in the State during 1960:

	Million dollars
Retail trade	812.0
Defense expenditures	373.1
Wholesale trade	358.1
Agriculture	282.7
Construction	275.4
Manufacturing	146.9
Tourist expenditures	135.0
Federal nonmilitary expenditures	109.0

2/ Imported is used herein to indicate goods reaching Hawaii from any source outside the State. Exported refers to shipments destined to points outside the State.

During this period employment averaged about 97 percent of the available labor force. The gross State product or aggregate value of all goods and services produced in 1960 was estimated at $1.7 billion and total personal income was $1.4 billion.

The Agricultural Situation 3/

Agriculture in Hawaii is made up of two broad categories; the first consists of the sugar and pineapple operations where the plantation-type enterprise is dominant and the other is the diversified sector where the average farm unit is small (table 10). Cattle ranches and a number of fruit and nut orchards fall between these two groups. By local definition diversified farming in the Islands consists of all agricultural activities other than the growing of sugar and pineapple. Although the acreage of the diversified farm may be small, the physical size alone is somewhat misleading because of multiple cropping with a year around growing season in most parts of the State. There are approximately 35 plantation units and over 5,000 smaller type commercial farms (including independent sugarcane and pineapple growers) in the 50th State.

Among the agricultural products of Hawaii, several enter importantly into the balance of trade situation. The principal export crops are sugar and pineapple, although other items such as coffee, tropical fruits, macadamia nuts, and floral products are shipped in volume to the mainland. The effective working of the law of comparative advantage so far as Hawaii's agriculture is concerned is indicated in part at least by the fact that the State imports substantial quantities of fruits, vegetables, and livestock products that could be produced locally but usually at a higher cost. So long as shipping service is available between Hawaii and the mainland and the transportation rates are within reason, it is likely that the Island farmers will continue to turn out the commodities in which they possess an advantage of cost or location. In sugar, for example, Hawaii has developed its production techniques to the point where it has the highest yield per acre in the world. Also, the industry has been a leader in mechanization of production.

Within rather broad limits the Hawaii farmer is protected by the location of the Islands in relation to other sources of supply. So long as local output is less that market requirements the price tends to reflect the cost of shipping directly competitive products to Hawaii, usually from the Pacific Coast. Conversely, the Hawaii price of export items would normally approach the level of the mainland price less the cost of transportation. This aspect of the pricing mechanism is a most important consideration in those cases where it is proposed to develop further the mainland or foreign markets for Hawaii farm products.

Plantation Crops

Sugar

Sugar has for many years been the leading commodity in Hawaii's agriculture. The State generally supplies about one-fifth of the sugar produced in the United States and accounts for some 10 to 11

3/ Data reported in this section and at most points herein are based primarily on "Statistics of Hawaiian Agriculture - 1959" and subsequent reports released by the Hawaii Cooperative Crop and Livestock Reporting Service, University of Hawaii, Honolulu. Reports published periodically by the Bank of Hawaii are also a major source of statistical data.

Table 10.--Quantity and value of agricultural products marketed, Hawaii, 1960

Product	Quantity		Value 1/
	Unit	Thousands	1,000 dollars
Sugar	Ton	936	127,000
Pineapple products	Case	14,287	113,000
Livestock and products:			
Market milk	Quart	52,991	10,144
Beef and dairy cattle	Pound	24,780	9,856
Hogs	do.	11,644	3,687
Poultry meat	do.	5,643	2,012
Eggs	Dozen	10,716	6,445
Honey and beeswax	Pound	243	30
Total			32,174
Diversified crops:			
Fruits	Pound	20,910	1,369
Vegetables and melons	do.	48,035	4,580
Coffee	do.	12,999	3,488
Macadamia nuts	do.	2,616	480
Taro	do.	9,706	594
Rice	do.	221	37
Total			10,548
All products			282,722

1/ Only the values indicated for diversified crops are computed on the basis of prices received by farmers. Some commodities such as floral products, sheep, alfalfa, etc., are not reported and are thus excluded from the total.

percent of the total quantity consumed. In most years since 1952 the value of Hawaii's sugar products has approached $150 million. This figure represents the output of 27 plantation and of some 1,200 independent cane growers who market their sugar through the plantation-owned facilities. All but one of the plantations own and operate sugar mills in which the cane is processed into raw sugar and molasses. Other byproducts are bagasse, pith, etc.

All of Hawaii's sugar and molasses is handled by the California and Hawaiian Sugar Refining Corporation, which operates refineries at Crockett, Calif., and Aiea, Hawaii, and has a working arrangement with a refinery in Texas. The "C & H" is an agricultural cooperative and its well-known brand of cane sugar is distributed widely throughout the area west of the Mississippi. Hawaii's sugar crop is harvested during some 10 months of each year and cane usually requires 22 to 24 months to mature. Sugar mills on the plantations generally operate for 24 hours a day during harvest. The refineries work on a year around basis. Among the recent innovations in sugar marketing, there has been a total conversion to bulk handling of raw sugar and molasses. This has involved development of special trucks, storage sheds and tanks, and loading and unloading facilities for the steamships that move raw sugar and molasses to the mainland. In the face of increasingly severe competition from beet sugar produced in the Western States the Hawaii sugar industry has conducted an aggressive merchandising program that has emphasized such things as brand advertising, improved packaging, better label design and tanker service for liquid sugar. Except for supplying the relatively small local market all of Hawaii's sugar is marketed on the United States mainland.

Pineapple

Pineapple is the second ranking agricultural commodity in the 50th State; in fact, Hawaii is now producing about two-thirds of the world supply of this product in the processed form. In recent years, the value of the annual pack of processed pineapple products has been in the $110 to $125 million range. Like sugar, the Hawaiian pineapple industry is based on large plantation units (operated by seven major companies) with only a very minor part of the crops being grown by independent contract farmers. At this point the similarity stops because the marketing pattern of pineapple is markedly at variance with the pattern in sugar.

Pineapple matures in about 18 months and the initial harvest is usually followed by one or two ratoon crops from the single planting. The peak of harvest occurs in July and August but sporadic harvesting goes on throughout the year. After harvest, the pineapple is processed immediately and it is then in final form ready to be shipped to both domestic and foreign markets. A relatively small part of the crop is consumed locally in the fresh form and fresh pineapple is shipped in some volume (about 15 million pounds annually) to mainland markets. Although mainland sales of fresh Hawaiian pineapple have been increasing, this outlet is still a minor factor in the marketing of the crop.

Each of the seven large pineapple companies operates processing facilities in which both fruit and juice are canned. In several of these plants freezing is also used in processing the pineapple. The pineapple industry is highly integrated in that distribution as well as production and processing is controlled by each company. During the depression years of the 1930's the pineapple producers of Hawaii set up and operated a marketing cooperative, but this joint effort was discontinued at the beginning of World War II. At present each company has its own brands, some of which are nationally advertised, but a substantial part of the pack is sold under buyer's or distributor's labels. This practice is especially prevalent among the smaller and less widely known packers. Shipments of processed pineapple products from Hawaii to foreign markets have accounted for some 17

percent of the local output of canned fruit and perhaps about 5 percent of the juice produced in recent years.

The pineapple industry has been facing a constantly growing competitive threat both at home and abroad. In the domestic market, the competition has consisted mostly of canned deciduous fruits and frozen juices, particularly orange concentrate. Increased attention to promotion has been apparent of late in the pineapple industry and new blends of pineapple and other juices have been developed recently. Frozen pineapple juice has also been placed on the market. Processed pineapple from Formosa, Malaya, Australia, the Philippines, and South Africa has been appearing in increasing quantity throughout Europe and other export areas to which Hawaii has been shipping its canned pineapple. Price-wise, this competition is very difficult to meet. The outlook is for continuing competitive pressure on this important Hawaii industry.

Livestock Products

Livestock products account for somewhat over 10 percent of the total agricultural income of Hawaii but among the diversified commodities these items are roughly three times as important as all crops (other than sugar and pineapple). In land utilization the livestock enterprises are users of large areas, but these extensive operations are generally limited to the beef cattle ranches. No Hawaii-produced livestock products other than hides, wool and honey are shipped out of the State; in fact, the Islands are on an import basis for all meats. The degree of self-sufficiency among the major livestock products is indicated by the following relationships of local production to total market supply in 1959:

	Percent
Beef and veal	57
Pork	49
Chicken meat	35
Eggs	79

Milk

Some 80 dairy farms in Hawaii produce fresh fluid milk. In 1960, these dairies produced almost 53 million quarts with a value of over $10 million. The dairy industry is understandably concentrated on Oahu, and it is largely a "dry lot" operation in which relatively little land area is required. Among the mixed feeds used by Hawaii's dairymen, only a small quantity of pineapple bran and molasses originates in the Islands. Of late a limited volume of alfalfa has been produced locally but the great bulk of the dairy feed, except green roughage, must be imported. Butter and cheese are not manufactured locally. Most ingredients of other dairy products such as ice cream, reconstituted milk and cottage cheese also are brought from the mainland.

Distribution of dairy products in Hawaii follows the conventional pattern found elsewhere in the United States. Direct branches or subsidiaries of three large mainland companies control most of the market on Oahu, but smaller local firms dominate the scene on the other Islands. Dairymen on Oahu are organized into informal bargaining groups and most dairy workers are unionized, but otherwise the milk market is essentially free of control except for the usual health and sanitation standards. Reconstituted milk processed in Honolulu has been supplied to the military services for some time, and it is now gaining some ground in the local retail trade. Just how far this product will develop as a competitive factor is not known, but a much more serious threat to Hawaii's dairymen is the prospect of a sterile concentrate becoming available in the near future.

Poultry Products

Egg production has been advancing at a remarkable rate in Hawaii with the 1960 output of 10.7 million dozen representing a threefold increase since 1950. At the same time the number of com-

mercial poultry farms has declined by almost 50 percent. Local eggs are graded, packed and distributed by a limited number of firms, including three cooperatives, as well as by some of the larger producers who have integrated production and marketing. Imported eggs (treated) are handled by a few wholesale receivers who grade, package, and store these eggs pending sale to retail stores.

The growth in poultry meat production is similar in that output is now some 2 1/2 times the 1950 volume. Chicken meat produced in the Islands is processed in volume by only two firms that perform slaughtering, packaging, and selling functions. Up to the present time, there is in Hawaii little of the vertical integration in poultry production and marketing that prevails in most parts of the United States. A serious competitive situation has developed between fresh poultry meat produced in the Islands, mostly from imported feed, and frozen poultry shipped from the mainland. Frozen poultry is sold by agents or brokers who represent mainland dealers.

Historically, there has for many years been a price premium for local poultry products over those shipped to Hawaii from outside points such as the Pacific Coast and Australia (eggs only). This price spread in favor of local products is narrowing constantly, especially on eggs where local producers are supplying 80 percent of the market. Further compression of the price premiums is in prospect if Hawaii poultrymen wish to take over a larger share of the local market. This will force the less efficient operators to adopt improved methods or face elimination in the competitive race. Basically, Hawaii is at a disadvantage because of the need for importation of practically all poultry feed.

Beef Cattle

More than 350 farms in Hawaii produce beef cattle in commercial quantities. These ranching operations vary greatly in size and range from fewer than 50 head of cattle to over 30,000 head; in fact, one ranch is among the larger units of its kind in the United States. Some of the cattle ranches are controlled by sugar plantations

Slaughter has been in excess of 40,000 head in recent years and the value of marketings has been averaging about $9.0 to $9.5 million annually. Honolulu is the principal outlet for these cattle and the major slaughter facilities are located there. Each island has its own slaughterhouses and there is little interisland movement of locally produced carcass beef. One sizeable meatpacking plant in Hawaii is cooperatively owned, but the other facilities are privately controlled although the major facility in Honolulu operates on a semicooperative basis. Live cattle shipped to Honolulu from neighboring islands are moved by oceangoing barges.

Until recently Hawaii's beef was not graded except on the basis of local brands. It was and remains the usual practice to label the local product as "Island Beef" at all levels of trade. Since 1959 a federally supervised grading program has been operating in Honolulu and U. S. Grades are appearing on a part of the local beef sold on Oahu. This move in the direction of Federal grades was precipitated by growing competition of U. S. Choice beef shipped in from the mainland, that was receiving more and more acceptance in the supermarkets. Most of the major meat processors in the United States have either sales representatives or branch houses in the 50th State. These branch units do a limited volume of processing but their major function is to serve as a clearing house for bulk shipments of frozen and processed meats of all types from the mainland. The other source of competition of some concern to the beef industry of Hawaii is the shipment of frozen beef to the Islands from Australia and New Zealand. Hawaii is a first stop of many vessels transporting beef from these countries and the tendency is to drop off substantial quantities of this beef at Honolulu. In another move to offset the competition of grain fed cattle from other areas, the local industry has initiated pen feeding operations in several locations. Some thought is also being given to economic aspects of slaughter at points nearer the ranches and shipment of carcasses to Honolulu.

Hogs

Hog production in Hawaii has been reasonably stable over the last 10 years but the number of swine farms has declined by over 40 percent. About 11.6 million pounds of pork valued at $3.7 million was marketed in 1960. Most Island pork is sold in the fresh form and it commands a premium over comparable cuts of the frozen product imported from the mainland. Strictly fresh cuts and carcasses are preferred by many local residents, particularly in preparing certain oriental dishes and for use at "luaus" or native feasts. Processed pork such as ham and bacon is almost completely of mainland origin. Hogs are produced and slaughtered on all islands. There is virtually no commercial shipment of hogs or pork among the Islands. From time to time live hogs have been shipped from the mainland to Hawaii, but this movement has declined of late. A few dealers, among them a producers' cooperative, dominate the distribution of fresh Island pork. Sausage products, using both pork and beef, are manufactured in Hawaii, but the bulk of the pork used by these plants is of mainland origin.

A major problem facing the pork producers of Oahu is the rapid expansion of the Honolulu metropolitan area which is forcing relocation of the hog farms. New locations, preferably on Oahu, are being sought by these farmers and some thought is being given to development of increased production on neighboring islands. For some time the local producers have been able to maintain a premium price for fresh pork, but in so doing they have been supplying a constantly smaller part of the growing market. This situation may have serious implications for the future of the industry.

Other Products

At one time Hawaii was exporting sizable quantities of honey and beeswax. This industry, however, has declined seriously since World War II, and there is little immediate prospect of a revival. Serious disease problems have been a major factor contributing to the difficulties of beekeepers in the Islands. There is a scattering of miscellaneous livestock production, including sheep, turkeys, and rabbits, throughout the State, but these items are now of only very minor importance. A comparatively recent enterprise that has promise of further development is the growing of dairy heifers for herd replacement. These dairy heifers are sold directly to the Island dairy farmers, who have been bringing some 2,000 head of young stock from the mainland each year. Fish is an important food item in Hawaii. Some fish farming is practiced, particularly in producing the mullet, which finds ready sale in the local fish markets.

Diversified Crops

Aside from sugar, pineapple and livestock products, the major sources of agricultural income in Hawaii, one other important segment consists of diversified crops that include vegetables, fruits, coffee, macadamia nuts, taro and rice. This group of commodities had a value of over $10.5 million in 1960 and thus represented some 4 percent of the State's gross income from all agriculture. Acreage devoted to diversified crops totaled almost 16,000 acres, about 5 percent of the lands devoted to all cultivated crops. It is in this segment of Hawaii's agriculture that the concentration of small farm units is found.

Coffee

Coffee is the most important single crop in the diversified group. It occupies about 40 percent of the land used for such crops, and in 1960 it represented some 30 percent of the value of diversified crops. Approximately 1,000 farmers produced coffee valued at $3.5 million from units averaging 6 acres in size.

The relatively low return for coffee in relation to area utilized for the crop is mostly a direct result of depressed coffee prices on the world market. Hawaii's

output of "Kona" coffee is so small (less than 1 percent) in relation to world supply that is is completely dependent upon price movements over which it exerts no influence. It is estimated that 85 percent of Hawaii's coffee is shipped to mainland and foreign markets where it is used as a blend with other types of coffee. The local Kona coffee sold in the Islands is not yet offered as a blend and it does not compete well with the blends imported from the mainland.

The bulk of the coffee produced in Hawaii is processed from the cherry to the parchment stage by the farmers themselves. Conversion from parchment to green (unroasted) coffee is handled by millers who operate their facilities seasonally. Perhaps 35 to 40 percent of the Hawaii coffee crop is now being milled in facilities operated by cooperative associations. Both the cooperatives and the private millers utilize the services of brokers in the domestic and foreign markets to which Kona coffee is shipped. In the United States the major outlets are San Francisco and Los Angeles, but a substantial quantity of green coffee is exported to the Phillippines and to Europe.

Vegetable and Melons

Vegetables and melons produced in Hawaii are almost exclusively for local consumption. Only small quantities of specialty items such as fresh ginger and lotus root are exported to the mainland. Except for oriental-style pickle products, there is no vegetable processing in Hawaii. The 50th State grows slightly over half of the truck crops that it consumes. Within the list of commodities the relationship of local production to imports ranges from self sufficiency in snap beans and cucumbers to practically total dependency on mainland sources for potatoes and carrots.

Most vegetables and melons can be grown in Hawaii, but it has proved more advantageous to import some products than to produce them locally. A part of the problem lies in the fact that vegetable growers in Hawaii operate very small units and the marketing system is not geared to the handling of larger quantities; furthermore, the entire market consists of fewer people than live in one moderate-sized city on the mainland. Hawaii's vegetable growers are quite aware of the dangers involved in oversupplying a "pocket" market such as Honolulu. This is another reason why fresh produce continues to be imported from the Pacific Coast. In regard to size of unit it is significant that although the number of truck farmers has declined almost 50 percent since 1950, the average farm in this group still contains less than 5 acres of cropland. Multiple cropping is the usual practice, however, with the result that the land is used intensively and the output per acre is relatively high.

Fruits

The situation with respect to fruits in Hawaii is somewhat different than for vegetables in that production is concentrated in only a few commercial crops. Papayas and bananas alone make up almost 90 percent of the value of fruit crops, with avocados, oranges and tangerines accounting for most of the remainder. There are also scattered plantings of mango, lichi, breadfruit, passion fruit, acerola cherry and other fruits, but these items have not yet assumed sufficient importance to be reported as separate commercial crops.

Among the major fruits, Hawaii is self sufficient only in papayas, bananas and avocados, and on an overall basis the State produces about 45 percent of the fruit reaching local markets. Imports of citrus and deciduous fruits are particularly heavy although at one time the Islands actually exported citrus and bananas to California. Except for fresh pineapples, papayas are the only fresh fruit that is shipped from Hawaii at the present time. Competition from other areas and difficulty in meeting plant quarantine regulations tend to discourage further development of export trade in exotic type fruits. Fruit growing enterprises number almost 800, but these units are generally even smaller than the vegetable farms. They

average less than 3 acres per unit although there are a number of large orchards of papayas and bananas and a few sizable plantings of passion fruit, acerola cherry, and mango.

Produce Marketing

Limited scale of operations is not restricted to the growers of fruits and vegetables in Hawaii; it is also very characteristic of the entire marketing and service structure through which the local produce moves to the retail level. It is estimated that perhaps one-third of the produce growers are members of the several cooperatives that have been set up in the production areas. These marketing associations handle some 15 to 20 percent of the output of fresh produce. At the wholesale level more than 50 dealers operate in the Honolulu market. In large part the local produce is handled on commission and even the cooperatives route much of their produce through the wholesale dealers. In contrast to the situation in many mainland markets, the Honolulu wholesalers continue to provide extensive services in the form of regrading and repacking the produce, frequent delivery, and liberal credit. A limited number of growers are delivering produce directly to supermarkets, but this practice is not at all prevalent as yet. By way of contrast, the supermarkets are receiving direct shipments of produce from the mainland with the result that local wholesalers must depend more and more on Hawaii produce as a source of income. The wholesale produce market in Honolulu includes two distinct and separate locations, both of which are poorly situated so far as accessibility and space are concerned. To a greater degree than at any other point in Hawaii's market structure, it is probable that the handling of fresh produce will undergo substantial changes in its physical and functional pattern.

Other Products

Taro, macadamia nuts, and rice are among the other crops of commercial importance in the Islands. It is from the taro root that poi is manufactured through a fairly simple process of cooking and straining. Poi was for many years the staple food of the native Hawaiians and it is still used extensively by some of the State's residents. The usual taro enterprise is about 2 1/2 acres in size and in recent years both acreage and number of units have been declining at a moderate rate. Substantially all poi is consumed locally where it is sold by many food stores and finds some outlet through "luaus" and use by tourists. Growers sell the taro root to a limited number of poi millers who in turn distribute the finished product, usually in plastic bags, to retail stores and other users.

Macadamia nut trees require 8 years to come into bearing. The macadamia has been produced in Hawaii for many years, but it is only of late that the crop has been gaining importance as a commercial activity. There are now over 200 macadamia nut plantings in the State. Although they average about 16 acres in size, the industry is dominated by a few large orchards where production and processing are integrated. Only 60 percent of the planted acreage was in bearing during the 1960 season. Macadamias are generally sold in the shell to the limited number of dealers who are equipped to shell, process and package the nuts. In some cases the processors are also growers and this leads to a closely integrated production and marketing situation. The macadamia nut has generally been considered a gourmet item on the mainland and in Hawaii it has been sold in fair volume to tourists and as a gift for shipment to points outside. Now that production is increasing constantly a real interest is developing in the broadening of the outlets for this product. Research conducted by the Hawaii Agricultural Experiment Station indicates that a mainland market for macadamias exists, providing the product is promoted properly and the retail price is reduced to a more realistic level.

Rice was at one time a principal farm crop in Hawaii. For many years, however, it has been a declining activity and now there are fewer than 20 growers with only

68 acres in rice. The few growers on Kauai who are continuing in this enterprise are producing only mochi rice, which is used for special purposes. The ordinary table rice that is used in large quantities by so many Island residents is brought from the mainland. Small, uneconomic production units in Hawaii cannot compete on even terms with the large, mechanized rice farms of California and other areas of the United States.

Hawaii ships several processed specialty products to the mainland. All these products are also consumed in varying amounts within the State. Among these commodities are nectars and puree of guava, papaya and passion fruit, pickled vegetables, jams and jellies and coconut products. Both canning and freezing are employed in manufacturing these processed foods. With aggressive marketing it is considered possible to develop a substantial export volume in these products, particularly passion fruit and guava juices. Acerola cherry is another commodity that offers some possibilities for processing and export.

Transportation

Composed as it is of several noncontiguous land areas separated by virtually open sea and being located at a distance of over 2,000 miles from the United States mainland, it is most understandable that transportation is a major factor in the entire economic life of the State. This observation applies particularly to the marketing of farm products whether they are consumed locally, mostly in the Honolulu metropolitan area, or shipped from the 50th State to mainland or foreign markets.

From Hawaii to the mainland regular service is available by both air and water. For the great bulk of agricultural commodities, the steamship is used because air cargo rates on most of these products are prohibitive. The major exception is floral products that have a high value in relation to their weight. A few fresh papayas are being shipped by air on an experimental scale. For the less perishable export items, steamship service is adequate and the rates have been considered reasonable. Substantially all mainland commodities of agricultural origin reaching the Islands are shipped to the several ports of Hawaii by steamship. Honolulu, of course, is the principal port of destination for these commodities.

Interisland freight moves by barge and by air, with the bulk of farm products destined for Honolulu from the neighboring islands being shipped by water. Floral products and a limited volume of fresh produce are moved among the islands by air freight. Lack of fast, economical transportation service among the islands tends to retard development of increased production of commodities for the Honolulu market by farmers located on islands other than Oahu. The State government and private interests as well are devoting considerable effort to development of plans that might lead to a solution of this particular transportation problem.

The highway system of each individual island in the State is generally adequate to provide ready access to the local markets for farmers located on the island. In general, there is no movement of Hawaii-produced agricultural products among the Islands except for the heavy flow from all producing areas to the Honolulu market. Proximity to market is advantageous and this factor is one of the principal reasons for continuing heavy production on Oahu despite the growing pressures of urban development. Plantations have private road systems that are used in hauling sugarcane to the mills and in harvesting pineapples. The highways of the State are important to the sugar and pineapple industries because they facilitate the movement of sugar and pineapple products to and from the processing plants as these commodities enter into domestic and foreign trade channels.

Retail and Military Outlets for Food Products

Some distinct changes have been occurring at the retail level in Hawaii. Until the close of World Was II the food trade in the Islands was completely dominated by small independent merchants. Retail stores were usually a family operation and they normally purchased their supplies through the conventional channels; i.e., local wholesalers, brokers and sales representatives. Since 1946, however, the supermarket has appeared on the local scene and the impact of these large scale units has been impressive, particularly in and around Honolulu. From 1948 to 1958 the number of retail food stores in Honolulu declined by one-third but sales per store more than doubled. With the advent of the supermarkets there was a marked increase in direct buying from the mainland, and several of the larger wholesale food firms have been liquidated. As direct buying in larger quantities moves over into the area of locally-produced foodstuffs, there will undoubtedly be some drastic changes at several points in the Island marketing system; e.g., it is doubtful whether local fruit and vegetables will continue to be sold by over 50 Honolulu wholesalers. Already certain of the large food stores have an integrated interest in the suppliers of some local products. The trends so apparent in Hawaii's retail food trade seem certain to continue and will lead to additional changes in the market structure of several commodities.

Sales of local products to military agencies located in Hawaii have developed into an important source of business for Hawaii's farmers. The procurement program of the Armed Forces has been tailored in part to fit the local situation in that some commodities are purchased through preplanting contracts, while others are bought on the open market following announcement of quantities desired. For the most part these purchases have been made through dealers although advance contracts may be entered into by producers or associations of producers. The military procurement program is particularly important in fresh fruits and vegetables and in dairy products. Also, some meats and a limited quantity of eggs are purchased locally for the mess and commissary operations. This outlet for Island farm products has not yet been exploited to the maximum by Hawaii's farmers; in fact, performance on contracts has been very disappointing to the military and civilian personnel who have devoted considerable effort to development of this market.